

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Allowable Claim 2 has been rewritten in independent form. Claim 1 has been amended to recite that the heat exchange medium supply pipe has a first portion provided entirely at one side of the screw bearing, and a second portion provided entirely at the other side of the screw bearing and extending out of the screw element, and that the split of the split pipes is provided at the first portion of the heat exchange medium supply pipe. Basis for this is evident from Figures 2 and 3 wherein it can be seen that the split pipe having the means for bendably connecting is located at a side of the bearing 15 (the right side in Figure 2) which is opposite the side of the portion which extends out of the screw element (the left side in Figure 2).

The present invention was developed in response to a problem whereby the screw in a mixer or extruder may flex under load during use, which flexure can cause fatigue fracturing of a heat exchange medium supply pipe extending within the screw (paragraph bridging pages 2-3). Therefore, according to a feature of the invention set forth in the claims, the heat exchange medium supply pipe comprises split pipes which are connected by means for bendably connecting the split pipes with each other. For example, the split pipes 2a and 2b may be connected by the pipe connecting joint 4 which permits bending of the connected pipes, or the bellows 6 which also permits bending of the connected pipes.

Moreover, the split pipes and pipe connecting means for bendably connecting the split pipes are now claimed as located in a portion of the heat exchange medium supply pipe opposite that which extends out of the screw element, relative to the screw support bearing. Thus they may be located so as to correspond to the location of the screw flexure under load during use and can reduce fatigue fracturing of the pipe.

Claims 1 and 3-5 were rejected under 35 U.S.C. §102 as being anticipated by U.S. patent 5,542,277 (Caspelherr et al.). This reference discloses a screw for simultaneously mixing and heating a fine-grained or paste-like substance. According to this reference, a screw shaft 11 is rotatably supported in a trough by bearings 16 and 17. The screw shaft is hollow and is supplied with a heat transfer medium via a valve 22 feeding the heat transfer medium to a conduit leading to the interior of the screw shaft by way of a flexible bellows 21. An electrical heating element 15 is mounted within the screw shaft to heat the heat transfer medium.

It is evidently the Examiner's position that the unnumbered fluid conduit at the left side of the screw shaft in Figure 1 of Caspelherr et al. is one split pipe of a heat exchange medium supply pipe, and that the valve 22 is the other split pipe, which split pipes are connected by the bellows 21 which comprises means for bendably connecting the split pipes with each other. In order to overcome this interpretation, Claim 1 has been amended to clarify that the split pipes are located at a portion of the heat exchange medium supply pipe opposite that which extends out of the screw element, relative to the screw support bearing. In contrast, the "split pipes" which are connected by the "pipe connecting means for bendably connecting said split pipes with each other" in Caspelherr et al. are in the portion of the heat transfer medium supply piping extending out of the screw shaft 11 – the opposite of the claimed location.

There is no disclosure in Caspelherr et al. of a portion of the heat exchange medium supply pipe provided entirely on a side of the bearing 16 which is opposite that extending out of the screw element, i.e., to the right of the bearing 16, and which comprises split pipes connected by pipe connecting means for bendably connecting the split pipes with each other. Applicants therefore submit that amended Claim 1 and its dependent claims define over Caspelherr et al. Additionally, this difference would not have been obvious to one skilled in

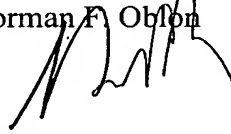
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the art since there is no suggestion in Caspelherr et al. for providing a bendable connection for a heat exchange medium supply pipe at a location corresponding to that where the screw shaft could flex under load. All of Claims 1-5 are therefore believed to be allowable.

Applicants therefore believe that the present application is in a condition for allowance and respectfully solicit an early notice of allowability.

Respectfully submitted,

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